

## POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	East- ern stand- ard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longi- tude	Longi- tude	Lat- tude	Spot	Group		
Mar. 29. . .	h. m.	°	°	°				
11 15		+36.0	193.1	+19.0		436		U. S. Naval.
		+40.5	197.6	+8.0	36			
		+50.0	207.1	+10.0	24		1,562	
Mar. 30. . .	12 14	-56.5	87.1	+15.0		97		
		-49.5	94.1	+9.0		73		
		-33.0	110.6	-9.0	97			
		+10.5	154.1	+11.0		242		
		+20.5	164.1	+9.5	194			
		+24.0	167.6	+7.0		291		
		-36.0	179.6	-15.0	48			
		+44.0	187.6	+17.0	48			
		+50.0	193.6	+20.5	121			
Mar. 31. . .	11 15	+54.0	197.6	+19.0		242	1,453	Do.
		-71.0	59.9	+23.0	145			
		-43.0	87.9	+16.0		170		
		-36.5	94.4	+9.0		97		
		-21.0	109.9	-9.0		145		
		+5.0	135.9	+9.5		170		
		+23.0	153.9	+10.5				
		+33.0	163.9	+9.0	242			
		+38.0	168.9	+6.5		242		
		+49.0	179.9	-15.0	48			
		+63.0	193.9	+19.0		242		
		+69.0	199.9	+17.0	194		1,792	

Mean daily area for 28 days, 1,152.

## PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MARCH 1937

[Dependent alone on observations at Zurich and its station at Arosa]

[Through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

March 1937	Relative numbers	March 1937	Relative numbers	March 1937	Relative numbers
1. . . . .	<i>Wac</i> 154	11. . . . .	98	21. . . . .	<i>Eac</i> 62
2. . . . .	<i>b</i> 154	12. . . . .	59	22. . . . .	<i>Mc</i> 74
3. . . . .	<i>Ec</i> 109	13. . . . .	<i>a</i> 41	23. . . . .	<i>d</i> 107
4. . . . .	<i>Ecd</i> 65	14. . . . .	21	24. . . . .	<i>d</i> . . .
5. . . . .	76	15. . . . .	20	25. . . . .	87
6. . . . .	71	16. . . . .	<i>Ec</i> 23	26. . . . .	<i>a</i> 80
7. . . . .	<i>Wc</i> 105	17. . . . .	22	27. . . . .	<i>Mac</i> 118
8. . . . .	<i>abd</i> 115	18. . . . .	<i>Eac</i> 37	28. . . . .	131
9. . . . .	107	19. . . . .	33	29. . . . .	<i>a</i> 117
10. . . . .	99	20. . . . .	<i>d</i> . . .	30. . . . .	<i>a</i> 135
				31. . . . .	<i>a</i> 145

Mean, 29 days=85.0.

*a*= Passage of an average-sized group through the central meridian.

*b*= Passage of a large group or spot through the central meridian.

*c*= New formation of a group developing into a middle-sized or large center of activity; E, on the eastern part of the sun's disk; W, on the western part; M, on the central circle zone.

*d*= Entrance of a large or average-sized center of activity on the east limb.

## AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By L. P. HARRISON

Mean free-air data based on airplane weather observations during the month of March 1937 are given in tables 1 to 3. A description of the methods by which the various monthly means and normals therein are computed may be found in this section of the MONTHLY WEATHER REVIEW for January 1937. The "normals" of temperature, pressure, and relative humidity at the 1,500 and 2,500 meter levels for the Navy stations were obtained in a manner slightly different from the usual method. Prior to the year 1934, the data in the columns for 1,500 and 2,500 meters were not computed. It has been found expedient to obtain these data by linear interpolation for the purpose of the present summary.

It will be noted that many of the "normals" are based on only 3 years of observations. Conclusions based on departures from such short-period "normals" must be used with caution.

The mean surface temperatures for March (see chart I) were below normal over the country except in the Pacific coastal States, and Nevada, southern Utah, western Colorado, as well as Idaho, Montana, and North Dakota, where they were generally above normal. The largest negative departures at the surface were largely concentrated in the south-central part of the country, with values ranging from about  $-1.5^{\circ}\text{C}$ . to  $-3.4^{\circ}\text{C}$ . In addition, a secondary region of rather pronounced negative departures at the surface occurred in a strip nearly 150 miles wide extending from the vicinity of western Tennessee northeastward to about Burlington, Vt., with a lower extreme departure of nearly  $-3.0^{\circ}\text{C}$ . The largest positive departures were principally confined to the northwestern border states with values ranging from  $+0.5^{\circ}\text{C}$ . to  $+2.5^{\circ}\text{C}$ . Elsewhere the departures were generally within the range  $\pm 1.5^{\circ}\text{C}$ .

The mean free-air temperatures for the month up to 5 km above sea level (table 1) were generally below normal over the country except the extreme northwestern section and the Florida Peninsula and vicinity, where they were

above normal. In harmony with the conditions at the surface, the most pronounced negative departures from normal were principally confined to an elliptical area extending (lengthwise) from the south-central to the north-eastern portion of the country, with the major axis roughly thrice the minor axis. The departures in this area ranged approximately from  $-1.5^{\circ}\text{C}$ . to  $-5.5^{\circ}\text{C}$ . (Oklahoma City at 1 km), with departures slightly more pronounced over the northeastern than over the northwestern sector above 2 km. In the extreme southwest, significantly subnormal free-air temperatures also occurred as exemplified by departures from  $-0.6^{\circ}\text{C}$ . to  $-2.9^{\circ}\text{C}$ . (at 2 km) over San Diego, Calif. The most pronounced positive departures occurred over the general area comprising the Northwestern States from Washington to Montana, with values ranging as high as  $+4.2^{\circ}\text{C}$ . (Spokane at 5 km). Elsewhere over the country, the departures from normal temperature were not very marked.

The mean free-air relative humidities and specific humidities are given in table 2. The mean relative humidities were moderately above normal in the Southwest, with maximum departures occurring at San Diego where they ranged from  $+4$  to  $+13$  percent. Over the central part of the country the departures were also generally positive by moderate amounts below 2 km, while above that elevation they were only slightly in excess of normal. Over the northern third of the country only slight positive departures from normal relative humidity generally prevailed, with maxima occurring near Billings and Boston, particularly in the lower strata ( $+10$  percent at surface, falling to  $+6$  percent at 1 km, over the former station; and  $+5$  to  $+9$  percent from 1 to 3 km, over the latter). Over the southeast, slight to moderate negative departures generally prevailed, except near the surface along the Gulf coast where the opposite was true. The extreme departures in this area occurred in the vicinity of Murfreesboro, Tenn., where the deficiencies with respect to normal ranged between  $-2$  percent and